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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/627,456	07/27/2000	Kazuki Yokota	NEC00P063-To	1109
21254	7590	10/30/2003	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			CRUZ, MAGDA	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/627,456

Applicant(s)

YOKOTA, KAZUKI

Examiner

Magda Cruz

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3/12/03.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 03/12/2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because an *Office Action* is not a published document. It has been placed in the application file, but the information referred to the *Korean Office Action* has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claim 1 and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al.

Chen et al. (US Patent Number 6,218,200 B1) discloses an overlay mark (40) having a pattern (46) formed by engraving a groove or an indent (Figure 2B) in a prescribed position on a layer where a circuit pattern is formed (column 2, lines 64-66), and a grooved pattern (46) that surrounds said mark pattern (54) so as to protect said mark pattern (54) from being deformed by thermal expansion or contraction of said layer (column 2, lines 57-60); wherein said groove pattern (46) is formed to surround said mark pattern (54) at a *substantially* equal interval and said grooved pattern is at least as deep as said mark pattern (column 2, line 61 through column 3, line 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-21 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Minami et al.

Chen et al. (US Patent Number 6,218,200 B1) discloses an overlay mark (40) used for measuring the overlay accuracy in forming a second circuit pattern over a first circuit pattern (column 3, lines 10-15), having a first lower-layer pattern (42) formed by engraving a groove or an indent (46), in the shape of a polygonal frame (Figure 2A), in a prescribed position on a first layer where the first circuit pattern is formed (column 2, lines 62-66), and an upper-layer pattern formed in a prescribed position on a second layer (50) where the second circuit pattern is to be formed (column 3, lines 1-3); a pair of bar-shaped patterns (110, 114) arranged parallel, facing each other with the upper pattern between (Figure 3A). An overlay mark used for making alignment (column 2, lines 32-33) to detect and decide an alignment position of a wafer (18) and a mask, in the step of exposure during photolithography to form a second circuit pattern over a first circuit pattern (column 2, lines 26-40). A semiconductor device having a substrate on which the overlay mark is formed (column 2, lines 48-52).

Chen et al. teaches the salient features of the present invention, except a second lower-layer pattern, in the shape of a polygonal frame. However, Chen et al. discloses a box pattern (46) printed on a layer (42).

Minami et al. (US Patent Number 6,368,980 B1) discloses a second lower-layer pattern (595) that is formed by engraving, on the first layer (540), a frame-shaped groove (598) to surround the first lower-layer pattern (540); wherein the first lower-layer pattern is utilized as an alignment mark at the time of alignment to superimpose a mask onto a wafer in the step of exposure (column 2, lines 35-55). The second lower-layer

pattern (595) is a grooved pattern in the shape of a polygonal frame (Figures 3A and 3B).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize a second lower-layer pattern, in the shape of a polygonal frame, as shown by Minami et al. in combination with the box pattern disclosed by Chen et al.'s invention, for the purpose of providing a resist mark having measurement marks which are not affected by the thermal flow phenomenon and which improve the alignment accuracy (column 2, lines 13-16).

6. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Minami et al. as applied to claims 2-21 and 24-25 above, and further in view of Kamuro.

Chen et al. (US Patent Number 6,218,200 B1) in view of Minami et al. (US Patent Number 6,368,980 B1) teaches the salient features of the present invention, except a third pattern comprising a groove pattern. However, Chen et al. discloses a first, second and third registration pattern (column 4, lines 49-56).

Kamuro (US Patent Number 6,316,328 B1) discloses a third pattern (column 10, lines 18-24) comprising a groove (i.e. slit) pattern.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the third pattern disclosed by Kamuro, in substitution of the third registration pattern from Chen et al.'s invention, for the purpose of providing a semiconductor device that is able to improve the lithography pattern-to-pattern overlay accuracy.

Response to Arguments

7. Applicant's arguments filed 07/17/2003 have been fully considered but they are not persuasive.

8. The applicant has argued that the prior art does not teach "a grooved pattern that surrounds the mark pattern so as to protect the mark pattern from being deformed by thermal expansion or contraction of the layer". However, Chen et al. (US Patent Number 6,218,200 B1) teaches said limitation. This is taught in column 2, lines 45-60.

9. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation can be found in Minami et al. (US Patent Number 6,368,980 B1), column 2, lines 13-16.

10. The applicant has argued, "Chen et al. does not teach or suggest that the second lower-layer pattern is in the shape of a polygonal frame". However, the examiner used Minami et al.'s patent to demonstrate the teaching of said limitation.

11. The applicant has argued that the prior art does not teach "a second lower-layer pattern that is formed by engraving, on the first layer, a frame-shaped groove to surround the first lower-layer pattern". However, Minami et al. (US Patent Number

6,368,980 B1) teaches said second lower- layer pattern (595) that is formed by engraving, on the first layer (540), a frame-shaped groove (598) to surround the first lower-layer pattern (540).

12. The applicant has argued, "both Chen, et el. and Minami, et el. can be removed by filing a verified translation of the priority document since the priority document of the present date has an effective date of July 28, 1999, whereas Chen, et el. and Minami, et el. have an effective date for prior art purposes of December 13, 1999, and July 14, 2000, respectively". However, the applicant did not file any translation of said documents.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sato et al. (US Patent Number 6,610,448 B2) discloses an alignment method, overlay deviation inspection method and photomask.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

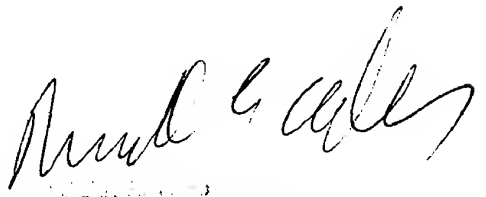
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Magda Cruz whose telephone number is (703)308-6367. The examiner can normally be reached on Monday through Thursday 8:00-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on (703)308-2847. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1782.


MAGDA CRUZ
SUPERVISOR, PATENT EXAMINER
ART UNIT 2851

Magda Cruz
Patent Examiner
October 21, 2003